

5/21/18

"Coming together is a beginning keeping together is progress working together is success."  
-Henry Ford

HW: Test 2 On Wednesday 5/23

AIM: Review for Test 2?

Warm Up:

17) Interval  $[-2, 4]$   $\leftarrow$  x-values

$f(x)$

x	f(x)
-2	1.25
4	80

$$\frac{80 - 1.25}{4 - (-2)} = \frac{78.75}{6} = 13.125$$

AROC  
 $f(x)$

$$g(x) = 4x^3 - 5x^2 + 3$$

$(-2, -49)$  and  $(4, 179)$

$$\begin{aligned} g(-2) &= 4(-2)^3 - 5(-2)^2 + 3 = \\ &= -32 - 20 + 3 = -49 \end{aligned}$$

$$\text{AROC} = \frac{179 - (-49)}{4 - (-2)}$$

$$\begin{aligned} g(4) &= 4(4)^3 - 5(4)^2 + 3 \\ &= 179 \end{aligned}$$

$$= \frac{228}{6} = 38$$

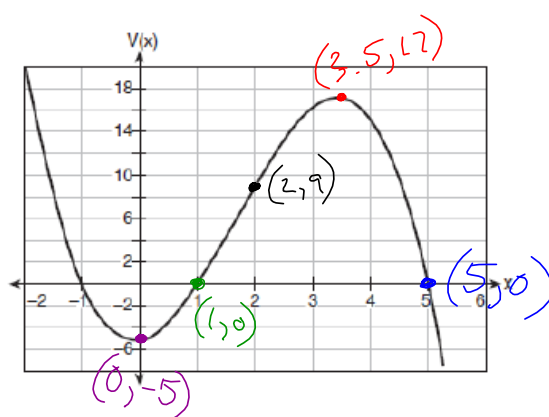
$$\begin{aligned} \text{AROC} \\ g(x) &= 38 \end{aligned}$$

$g(x)$  has AROC of 38

$f(x)$  has AROC of 13.125

$g(x)$  has bigger AROC

15. A cardboard box manufacturing company is building boxes with length represented by  $x + 1$ , width by  $5 - x$ , and height by  $x - 1$ . The volume of the box is modeled by the function below.



Over which interval is the volume of the box changing at the fastest average rate?

a.  $[1, 2]$   $\leftarrow \frac{9-0}{2-1} = 9$

b.  $[1, 3.5]$   $\leftarrow \frac{17-0}{3.5-1} = \frac{17}{2.5} = 6.8$

c.  $[1, 5]$   $\leftarrow \frac{0-0}{5-1} = 0$

d.  $[0, 3.5]$

$\frac{17-(-5)}{3.5-0} = \frac{22}{3.5} = 6.29$

7)  $x = \underline{12}$  when  $y = \underline{7}$

$\underline{y} = ?$   
when  $x = \underline{15}$

$$\frac{x}{y}$$

~~$$\frac{12}{7} = \frac{15}{y}$$~~

$$\frac{12y}{12} = \frac{105}{12}$$

$$y = 8.75$$

14. Joelle has a credit card that has a 19.2% annual interest rate compounded monthly.

She owes a total balance of  $B$  dollars after  $m$  months. Assuming she makes no payments on her account, the table below illustrates the balance she owes after  $m$  months.

$m$	$B$
0	1000.00
10	1172.00
19	1352.00
36	1770.80
60	2591.90
69	2990.00
72	3135.80
73	3186.00

$$\frac{2591.9 - 1172}{60 - 10} = 28.4$$

$$\frac{2990 - 1352}{69 - 19} = 32.8$$

$$\frac{3135.80 - 1770.80}{72 - 36} = 37.9$$

$$\frac{3186 - 2591.90}{73 - 60} = 45.7$$

Over which interval of time is her average rate of change for the balance on her credit card account the greatest?

- a. month 10 to month 60
- b. month 19 to month 69

c. month 36 to month 72

d. month 60 to month 73

9)  $\frac{\text{distance}}{\text{time}^2} \quad \frac{40}{2^2} = \frac{d}{4^2}$

~~$\frac{40}{4} = \frac{d}{16}$~~

$$\frac{640}{4} = \frac{4d}{4}$$

$$d = 160 \text{ meters}$$

8) \$44.70 for 6 hrs      ? in 8 hours

$\frac{\text{money}}{\text{hour}}$

~~$\frac{44.70}{6} = \frac{x}{8}$~~

$$\frac{6x}{6} = \frac{357.60}{6}$$

$$x = \$59.60$$

1)  $x=32$   $y=8$  Direct variation

~~$\left(\frac{y}{x} = \frac{8}{32}\right)$~~

$y = \frac{8}{32}x \Rightarrow y = \frac{1}{4}x$

2)  $x=4$   $x=?$   
 $y=9$   $y=144$

$\frac{y}{x} = \frac{9}{4} = \frac{144}{x}$

$\frac{9x}{9} = \frac{576}{9}$

$x = 64$

3)  $x=3$   $x=?$   
 $y=7$   $y=98$

$\frac{7}{3} = \frac{98}{x}$

$\frac{7x}{7} = \frac{294}{7}$

$x = 42$

4)  $\frac{\text{Cost}}{\text{dozen}} \quad \frac{10.60}{4} = \frac{x}{7}$

$74.20 = 4x$

$18.55 = x$

$\boxed{\$18.55}$

5)  $\frac{\text{Cost}}{\text{miles}} \quad \frac{2240}{2200} = \frac{x}{4000}$

$\frac{896000}{2200} = \frac{2200x}{2200}$

$\boxed{\$4072.73} = x$

6)  $p = 7 \quad p = ?$   
 $q = 9 \quad q = 12$

$$\frac{9}{7} = \frac{12}{p}$$

$$\frac{9p}{9} = \frac{84}{9}$$

$\boxed{p = \frac{28}{3}}$



$$\begin{array}{ll} 7) & x=12 \quad x=15 \\ & y=7 \quad y=? \end{array}$$

$$\frac{7}{12} = \frac{y}{15}$$

$$105 = 12y$$

$$y = 8.75$$

16. The distance needed to stop a car after applying the brakes varies directly with the square of the car's speed. The table below shows stopping distances for various speeds.

<b>Speed</b> (mph)	10	20	30	40	50	60	70
<b>Distance</b> (ft)	6.25	25	56.25	100	156.25	225	306.25

Determine the average rate of change in braking distance, in ft/mph, between one car traveling at 50 mph and one traveling at 70 mph.

$$\frac{306.25 - 156.25}{70 - 50} = 7.5 \text{ ft/mph}$$

10. Solve the system of equations for x and y:

$$\begin{array}{r} 2(2x + y = 4) \\ 4x - 3y = 13 \end{array} \rightarrow \begin{array}{r} 4x + 2y = 8 \\ 4x - 3y = 13 \\ \hline 5y = -5 \\ y = -1 \end{array}$$

use  
 $y = -1$

$$2x + (-1) = 4$$

$$2x - 1 = 4$$

$$\frac{2x}{2} = \frac{5}{2} \quad x = \frac{5}{2}$$

$$\boxed{x = \frac{5}{2} \quad y = -1}$$

11. Solve the system for x and y:

$$\begin{array}{r} 4x - 2y = 2 \\ \oplus \quad -3x + 2y = 0 \\ \hline \end{array}$$

$$x = 2$$

use to find y:

$$4(2) - 2y = 2$$

$$\begin{array}{r} 8 - 2y = 2 \\ -8 \quad -8 \end{array}$$

$$\begin{array}{r} -2y = -6 \\ -2 \quad -2 \end{array}$$

$$y = 3$$

\* Check:

$$4(2) - 2(3) = 2$$

$$8 - 6 = 2$$

$$2 = 2 \quad \checkmark$$

$$-3(2) + 2(3) = 0$$

$$-6 + 6 = 0$$

$$0 = 0 \quad \checkmark$$



12. Solve the following system of equations for  $x$ ,  $y$ , and  $z$ :

$$\textcircled{1} \quad x + y - z = 5$$

$$\textcircled{2} \quad 3x - 2y + z = 8$$

$$\textcircled{3} \quad 2x + 2y - 2z = 7$$

$$-2\textcircled{1} + \textcircled{3}$$

$$-2(x + y - z = 5) \rightarrow -2x - 2y + 2z = -10$$

$$\textcircled{+} \quad 2x + 2y - 2z = 7$$

$$0 = -3$$

No Solution

13. Solve the following system of equations for  $x$ ,  $y$ , and  $z$ :

$$\begin{array}{l} \textcircled{1} \quad x + y = 3 \\ \textcircled{2} \quad -y + z = 3 \\ \textcircled{3} \quad x + 2z = 10 \end{array}$$

Because  $\textcircled{2}$  only has  $y$  and  $z$ , we can use it with  $\textcircled{4}$

$$\begin{array}{r} \textcircled{1} - \textcircled{3} \\ \hline x + y = 3 \\ \ominus \quad x + 2z = 10 \\ \hline \textcircled{4} \quad y - 2z = -7 \end{array}$$

$$\begin{array}{r} -y + z = 3 \\ \oplus \quad y - 2z = -7 \\ \hline -1z = -4 \\ \textcircled{z = 4} \end{array}$$

Find  $x$ :

$$\begin{array}{r} x + y = 3 \\ x + 1 = 3 \\ \hline -1 \quad -1 \\ \hline \textcircled{x = 2} \end{array}$$

Find  $y$ :

$$\begin{array}{r} -y + z = 3 \\ -y + 4 = 3 \\ \hline -4 \quad -4 \\ \hline -y = -1 \\ \textcircled{y = 1} \end{array}$$

Check

$$\begin{array}{l} \textcircled{1} \quad x + y = 3 \\ \quad 2 + 1 = 3 \\ \quad 3 = 3 \checkmark \end{array}$$

$$\begin{array}{l} \textcircled{2} \quad -y + z = 3 \\ \quad -1 + 4 = 3 \\ \quad 3 = 3 \checkmark \end{array}$$

$$\begin{array}{l} \textcircled{3} \quad x + 2z = 10 \\ \quad 2 + 2(4) = 10 \\ \quad 2 + 8 = 10 \\ \quad 10 = 10 \checkmark \end{array}$$